

a layer having a non-planar surface within the device structure, positioned at height  $x$ , where  $0 \leq x < z$ , between heights  $x$  and  $z$ ;  
contacts for applying a voltage across the active region;  
a light emission property that varies within the aperture; and  
wherein the refractive index varies in the plane perpendicular to light output and the light output is in spatially fixed modes.

4. (Original) A vertical cavity surface-emitting laser, as defined in claim 3, wherein the refractive index has a lengthscale on the order of the lasing wavelength.

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5. (Original) A vertical cavity surface-emitting laser, as defined in claim 3, further comprising a substrate having a first side adjacent to the lower distributed Bragg reflector.

6. (Original) A vertical cavity surface-emitting laser, as defined in claim 5, further including a texturing layer interposing the substrate and the device structure, wherein the non-planar layer is the texturing layer.

7. (Original) A vertical cavity surface-emitting laser, as defined in claim 6, wherein the texturing layer is patterned.

8. (Original) A vertical cavity surface-emitting laser, as defined in claim 5, wherein the non-planar layer is a layer within at least one of the upper and lower distributed Bragg reflectors.

9. (Original) A vertical cavity surface-emitting laser, as defined in claim 5, wherein the layer within at least one of the upper and lower distributed Bragg reflectors is patterned.

10. (Original) A vertical cavity surface-emitting laser, as defined in claim 5, wherein non-planar layer is a first surface of the substrate adjacent the lower Bragg reflector.

11. (Original) A vertical cavity surface-emitting laser, as defined in claim 10, wherein the first surface is patterned.

12. (Previously Amended) A vertical cavity surface-emitting laser, as defined in claim 5, wherein the non-planar layer introduces a phase mismatch in the device structure.

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13. (Original) A vertical cavity surface-emitting laser, as defined in claim 12, wherein the non-planar layer is a layer within at least one of the upper and lower distributed Bragg reflectors.

14. (Original) A vertical cavity surface-emitting laser, as defined in claim 13, wherein the layer within at least one of the upper and lower distributed Bragg reflectors is patterned.

15. (Previously Amended) A vertical cavity surface-emitting laser, as defined in claim 5, further comprising a planarizing plane within the device structure, positioned at height  $y$ , where  $x < y < z$ .

16. (Original) A vertical cavity surface-emitting laser, as defined in claim 15, between heights  $x$  and  $y$ , the refractive index varies in the plane perpendicular to the light output.

17. (Original) A vertical cavity surface-emitting laser, as defined in claim 15, wherein the refractive index has a lengthscale on the order of the lasing wavelength.

18. (Original) A vertical cavity surface-emitting laser, as defined in claim 15, further comprising a substrate having a first surface adjacent to the lower distributed Bragg reflector.

19. (Original) A vertical cavity surface-emitting laser, as defined in claim 18, further including a texturing layer interposing the substrate and the device structure, wherein the non-planar layer is the texturing layer.

20. (Original) A vertical cavity surface-emitting laser, as defined in claim 19, wherein the texturing layer is patterned.

21. (Original) A vertical cavity surface-emitting laser, as defined in claim 19, wherein the non-planar layer is a layer within at least one of the upper and lower distributed Bragg reflectors.

22. (Original) A vertical cavity surface-emitting laser, as defined in claim 18, wherein the layer within at least one of the upper and lower distributed Bragg reflectors is patterned.

23. (Original) A vertical cavity surface-emitting laser, as defined in claim 18, wherein non-planar layer is a first surface of the substrate adjacent the lower Bragg reflector.

24. (Original) A vertical cavity surface-emitting laser, as defined in claim 23, wherein the first surface is patterned.

25. (Original) A vertical cavity surface-emitting laser, as defined in claim 15, wherein the non-planar layer introduces a phase mismatch in the device structure.

26. (Original) A vertical cavity surface-emitting laser, as defined in claim 25, wherein the non-planar layer is a layer within at least one of the upper and lower distributed Bragg reflectors.

27. (Original) A vertical cavity surface-emitting laser, as defined in claim 25, wherein the layer within at least one of the upper and lower distributed Bragg reflectors is patterned.

28. (Currently Amended) A method for manufacturing a vertical cavity surface emitting laser comprising the steps of:

preparing a substrate such that there is a layer having a textured surface having a light emission property that varies within the aperture;

depositing a lower distributed Bragg reflector;

depositing an active layer;

depositing an upper distributed Bragg reflector; and

fabricating electrical contacts for applying a voltage across the active layer.

29. (Original) A method for manufacturing a vertical cavity surface emitting laser, as defined in claim 28, further comprising the step of removing the substrate after the step of fabricating electrical contacts.

30. (Currently Amended) A method for manufacturing a vertical cavity surface emitting laser comprising the steps of:

depositing a lower distributed Bragg reflector having a layer having a textured surface having a light emission property that varies within the aperture;

depositing an active layer;

depositing an upper distributed Bragg reflector; and

fabricating electrical contacts for applying a voltage across the active layer.

31. (Currently Amended) A method for manufacturing a vertical cavity surface emitting layer comprising the steps of:

depositing a lower distributed Bragg reflector;

depositing an active layer having a layer having a textured surface having a light emission property that varies within the aperture;

depositing an upper distributed Bragg reflector; and

fabricating electrical contacts for applying a voltage across the active layer.

32. (Currently Amended) A method for manufacturing a vertical cavity surface emitting layer comprising the steps of:

depositing a lower distributed Bragg reflector;

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depositing an active layer;  
depositing an upper distributed Bragg reflector having a layer having a textured  
surface having a light emission property that varies within the aperture; and  
fabricating electrical contacts for applying a voltage across the active layer.

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